

Claims

What is claimed is:

1. An electrostatic discharge monitor and control system comprising:  
a cup holder to hold a target device;  
an antistatic solution dispenser positioned above the target device to dispense an antistatic solution on the target device;  
a sensor arm attached to the cup holder;  
a sensor attached to the sensor arm and positioned a determined distance above the target device for monitoring static charge and providing feedback data; and  
a controller coupled to the antistatic solution dispenser, the sensor arm and the sensor to receive monitoring data from the sensor, control dispensing of the antistatic solution, control positioning of the sensor and control moving of the sensor arm.
2. The electrostatic discharge monitor and control system of claim 1, wherein the target device is a wafer having at least one semiconductor device.
3. The electrostatic discharge monitor and control system of claim 1, wherein the target device is a mask.
4. The electrostatic discharge monitor and control system of claim 1, wherein the antistatic solution dispenser dispenses distilled water.
5. The electrostatic discharge monitor and control system of claim 1, wherein the antistatic solution dispenser dispenses resist.
6. The electrostatic discharge monitor and control system of claim 1, wherein the antistatic solution dispenser dispenses developer.
7. The electrostatic discharge monitor and control system of claim 1, wherein the antistatic solution comprises distilled water and a surfactant.

8. The electrostatic discharge monitor and control system of claim 1, wherein the antistatic solution comprises distilled water and a dilute acetic acid.
9. An electrostatic discharge monitor and control system comprising:  
a cup holder to hold a target device;  
an antistatic solution dispenser positioned above the target device to dispense an antistatic solution on the target device;  
a sensor attached to the antistatic solution dispenser and positioned a determined distance above the target device for monitoring static charge; and  
a controller coupled to the antistatic solution dispenser and the sensor to receive monitoring data from the sensor, control dispensing of the antistatic solution and control positioning of the sensor.
10. The electrostatic discharge monitor and control system of claim 9, wherein the target device is a wafer.
11. The electrostatic discharge monitor and control system of claim 9, wherein the antistatic solution comprises a first solution and a second solution.
12. The electrostatic discharge monitor and control system of claim 11, wherein the first solution is stronger with respect to reducing static charge the second solution.
13. The electrostatic discharge monitor and control system of claim 12, wherein amounts of the first solution and amounts of the second solution are varied to achieve a desired strength of the antistatic solution.
14. The electrostatic discharge monitor and control system of claim 9, wherein the antistatic solution comprises distilled water and a material selected from the group comprising  $\text{H}_2\text{CO}_3$ ,  $\text{H}_3\text{PO}_4$ ,  $\text{HBr}$ ,  $\text{HI}$  and  $\text{HNO}_3$ .
15. An electrostatic discharge monitor and control system comprising:  
a sensor to monitor static charge on a surface of a target device;

an antistatic solution dispenser able to dispense an antistatic solution at a selected flow rate;

a controller coupled to the sensor and the antistatic solution dispenser to analyze static charge data from the sensor and automatically initiate dispensing of the antistatic solution.

16. The electrostatic discharge monitor and control system of claim 15, wherein the sensor comprises a plurality of individual sensors.

17. The electrostatic discharge monitor and control system of claim 15, wherein the sensor monitors portions of the surface.

18. The electrostatic discharge monitor and control system of claim 15, wherein the sensor monitors the entire surface.

19. The electrostatic discharge monitor and control system of claim 15, wherein the controller analyzes the effectiveness of the antistatic solution.

20. A method comprising:  
providing a target device;  
performing a drying process;  
monitoring static charge on a surface of the target device during the drying process; and  
on the static charge exceeding a threshold value, initiating a corrective action.

21. The method of claim 20, wherein initiating the corrective action comprises:  
setting a flow rate and composition for an antistatic solution;  
dispensing the antistatic solution according to the flow rate and composition while continuing to monitor static charge on the surface of the target device;  
adjusting the flow rate and composition based on the monitored static charge;  
halting dispensing of the antistatic solution on the monitored static charge falling below an acceptable level.

22. The method of claim 21, wherein setting the composition comprises selecting amounts of at least one solution to comprise the antistatic solution.
23. The method of claim 20, wherein performing a drying process comprises an accelerated spinning of the target device.
24. The method of claim 21, wherein initiating the corrective action comprises:  
interrupting the drying process;  
dispensing distilled water on the target device;  
dispensing an antistatic solution on the target device;  
dispensing distilled water on the target device; and  
resuming the drying process.
25. A method of controlling static charge comprising:  
establishing a base value for a target device;  
establishing a threshold value for the target device;  
establishing an acceptable value for the target device;  
monitoring a static charge for the target device;  
on the static charge exceeding the threshold value, initiating a corrective action;  
continuing to monitor the static charge; and  
on the static charge decreasing below the acceptable value, halting the corrective action.
26. The method of claim 25, wherein establishing a threshold value comprises determining the threshold value as a function of the base value.
27. The method of claim 25, wherein establishing an acceptable value comprises determining an acceptable value based on the target device.
28. The method of claim 25, wherein establishing an acceptable value includes determining an acceptable value based on reducing the time required for the corrective action while reducing the static charge for the target device.

29. A method of fabricating a semiconductor device comprising:
- providing a wafer having at least one semiconductor layer;
  - depositing a layer of photoresist over that at least one semiconductor layer;
  - exposing portions of the layer of photoresist;
  - developing the layer of photoresist;
  - controlling static charge on the wafer using an electrostatic discharge controller while drying the wafer; and
  - measuring critical dimensions of the wafer using a scanning electron microscope.
30. The method of claim 29, wherein measuring critical dimensions comprises obtaining critical dimension measurements substantially equal to actual critical dimension measurements.